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AGO ltr 29 Apr 1980 ; AGO ltr 29 Apr 1980	

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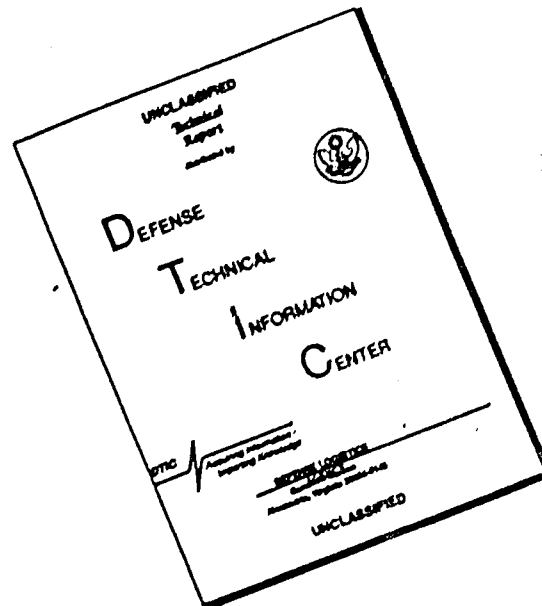
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DEPARTMENT OF THE ARMY
OFFICE OF THE ADJUTANT GENERAL
WASHINGTON, D.C. 20310

IN REPLY REFER TO

AGDA (M) (31 Oct 69) FOR OT UT 693051

12 December 1969

SUBJECT: Operational Report - Lessons Learned, Headquarters, 36th Engineer Battalion, Period Ending 31 July 1969 (U)

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1. Subject report is forwarded for review and evaluation in accordance with paragraph 5b, AR 525-15. Evaluations and corrective actions should be reported to ACSFOR OT UT, Operational Reports Branch, within 90 days of receipt of covering letter.
2. Information contained in this report is provided to insure appropriate benefits in the future from lessons learned during current operations and may be adapted for use in developing training material.

BY ORDER OF THE SECRETARY OF THE ARMY:

A handwritten signature in cursive script, reading "Kenneth G. Wickham", is positioned above the typed name.

KENNETH G. WICKHAM
Major General, USA
The Adjutant General

1 Incl
as

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 - 36th Engineer Battalion

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UNITED STATES ARMY
HEADQUARTERS, 37th ENGINEER GROUP (Const)
APO SF 96320

EGF-0

10 July 1969

CSG: 1. Operational Report - Lessons Learned (ECS-CSEFOR R1) for Quarterly Period Ending 31 July 1969

Commander-in-Chief, United States Army, Pacific, ATTN: GPOP-OT, APO 96588
Commanding General, United States Army, Vietnam, ATTN: AVHCC-OH, APO 96307
Chief of Staff, 37th Engineer Group (Const), ATTN: EGF-OP, APO 96320

1. SECTION 1, OPERATIONS - Significant Activities

a. From 1 May 1969 thru 30 June 1969 the battalion construction effort was almost entirely devoted to the restoration of National Highway 4 from My Thuan to Ft. Gien in A. Long Province. The project required repair and upgrade of 10.3 km of existing road and construction of 11.6 km of realigned road using clay lime and clay-lime-cement stabilization. As of 31 July 1969 progress on the new alignment included completion of 10.3 km of embankment fill, 4.6 km of clay-lime subbase and 3.6 km of clay-lime-cement base course. Completion of the 16 km of repair and upgrade included placing of 13.6 km of sand fill, 13.6 km of subbase, 12.8 km of rock base course, and 7.2 km of surface treatment.

b. From 1 July 1969 the battalion was largely devoted to the construction of base facilities at Vinh Long Army Airfield. Vertical construction includes 8-20'x144' two story troop billets, 9-20'x48' prefab buildings, MER latrines and showers, 2-10,500 gallon water storage tanks, 2-20'x40' concrete maintenance pads and 1-20'x120' Hangers. Five of the 20'x144' two story buildings, the MER latrines and shower and the 2-20'x40' concrete maintenance pads have a directed completion date of 2 August 1969. As of 31 July 1969 these facilities are 80% percent complete. In addition the battalion was given the mission of constructing 44,000 sq yds of aircraft parking apron with maintenance hardstand and runways all to be completed by 23 August 1969. This project as of 31 July 1969 is 45% complete and involved the movement of a 200,000 cubic yard sand stockpile, placing of 8" inches 10% sand cement base course with single bituminous surface treatment and construction of 29 Helicopter revetments.

c. During the period the battalion received large quantities of construction materials for National Highway 4, which amounted to an average of 6,500 short tons per month off-loaded at Vinh Long. To sufficiently handle this quantity of material the battalion constructed a floating barge pier made accessible by means of an articulating ramp.

d. During the period the battalion continued operation of the Vinh Long rock off-loading facility. Monthly off-loading production rates were 20,600 tons in May, 21,875 tons in June and 24,378 tons in July. On 15 July, 1356 tons were off-loaded in a 24 hour period setting a record for any rock off-loading facility in the Delta.

FOR OT UT

693051

Inclosure

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EGFE-OP

SUBJECT: Operational Report - Engineer Battalion (RUC-CSFOR RI) for Quarterly Period Ending 31 July 1969

e. During the period the battalion operated one field water purification plant. The 1500 gph erillator augmented the water production of the Vinh Long Army Airfield by producing 30,000 gallons of purified water daily.

f. During the period the battalion was augmented with commercial construction equipment under the LOC-MOS equipment program. As of 31 July 1969 the battalion had received 25 pieces of equipment. Equipment received this period included a 6 CY transit mix truck, a gradall, a soil stabilization plant and a concrete batch plant. With the exception of the 12 CY dump trucks, this completes the MSA/LOC equipment program for the battalion.

g. On 29 July 1969, the battalion was presented with the Meritorious Unit Commendation per G.O. 42, Headquarters, Department of the Army, for the period 1 Oct 1967 to 31 Aug 68, for outstanding engineer support which included operation of a rock quarry, construction of bridges, establishment of base camps and restoration of QL-15.

h. During the period the battalion had approximately 100 attached personnel and 27 pieces of equipment from other battalions within the Group in support of QL-4. Personnel were attached to various companies depending on the mission of the companies and the skills of the attached personnel.

i. During the period the battalion inprocessed 300 personnel as replacements and outprocessed 209 personnel for reassignment or seperation.

j. During the period the battalion extended 80 days performing its construction and support missions, 6 days undergoing mandatory training and 6 days non-duty time.

2. SECTION I, Operations-Organization

a. Organic Units

- (1) HQ, 36th Engineer Battalion (Const)
- (2) A Co, 36th Engineer Battalion (Const)
- (3) B Co, 36th Engineer Battalion (Const)
- (4) C Co, 36th Engineer Battalion (Const)
- (5) D Co, 36th Engineer Battalion (Const)

b. Operational Control

- (1) Second Platoon, 523rd Engineer Company (PC)

3. SECTION II, Lessons Learned, Commander's Observations, Evaluations and Recommendations:

a. Personnel: None

b. Operations:

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EGFE-OP

SUBJECT: Operational Report -Lessons Learned (RCS-CSFOR R1) for Quarterly
Period Ending 31 July 1969

(1) Tidal changes in rice paddies

(a) Observation: In the Mekong Delta production rate of heavy earthmoving equipment is related to the tidal changes.

(b) Evaluation: The rate of the progress schedule for the embankment fill for the realigned portion of QL-4 is directly related to the tidal extremes which are in turn a function of solar-lunar alignment. At this time of the year highest tides are following the full moon by four days.

(c) Recommendation: Place maximum earthmoving effort in the rice paddy borrow areas during periods of low tide to gain highest production rates. Scheduling of this work should take in account the effort of the moon on the tides.

(2) D-7E Dozers in rice paddies

(a) Observation: The ability of a D-7E to work in a rice paddy is directly related to the in-place moisture content of the soil.

(b) Evaluation: In those rice paddies where the water table has dropped during the dry season, the dozer can work to a depth of one foot below the water table. At that point the dozer exceeds the soil bearing capacity and then becomes mired. In the paddies which do not dry, the soil bearing capacity is never adequate to support a dozer and no work is possible. In the areas where the paddies remain inundated all year, the soil does not have adequate shear strength to support dozer operations. The reason for this lack of strength is explained by the process of Delta soil formation. The soil in the paddies gain strength from iron oxides and other materials formed by oxidation and leaching as the water table rises and falls with the tidal action. In the paddies which remain inundated all year, the soil is always in a reducing environment and the strengthening oxides do not form.

(c) Recommendation: In planning future clay borrow areas use only those which are not covered with water during the entire year. The alignment of the road should be carefully selected and where possible should be aligned through paddies which do not remain inundated year round. If this is impossible, hauling of fill is required and should be so scheduled.

(3) Clay Embankment

(a) Observation: D-7E Dozers were unable to push raw clay up for the embankment fill on portions of the new alignment of QL-4, where the adjacent rice paddies were inundated year round. This necessitated the use of scrapers to haul fill from paddies which were not constantly inundated.

(b) Evaluation: In placing the lower lifts of embankment fill with scrapers, approximately 75% more fill is required than by placing fill with dozers. This difference is due to excessive settlement of the subgrade caused by the much heavier, loaded scraper.

ECFE-OF

SUBJECT: Operational Report - Lessons Learned (RGS-CSEFOR R1) for Quarterly Period Ending 31 July 1969

(c) Recommendation: Use the D-7E for placing embankment fill from rice paddies, whenever possible and if scrapers are needed plan and schedule approximately 17% additional fill requirement.

(4) VC Mining Techniques

(a) Observation: The VC continued this period to place AT mines in the embankment fill.

(b) Evaluation: The VC are burying the AT mines in nylon plastic bags about 2 feet below the embankment fill. Mine detectors have greater difficulty detecting the mines because of the depth and the nylon bags. The mines will not detonate until several passes by the equipment finally compacts the earth above and activates the firing device.

(c) Recommendation: Employ ambush patrols to prevent further mining incidents and careful effective use of mine detectors.

(5) Haul Roads in Clay Borrow Areas

(a) Observations: Haul roads in clay borrow areas are extremely difficult to maintain during the rainy season.

(b) Evaluation: Rain causes extensive swell in clay, slight swell in lime-stabilized clay, and no swell in lime-cement stabilized clay. Traffic on a road after a rain causes deep ruts to form in the raw clay while little or no ruts form in either the lime-stabilized or lime-cement stabilized clay. Also the lime stabilized clay will dry in approximately one-half the time required for drying of the raw clay.

(c) Recommendation: In order to maintain a suitable haul road during the rainy season, the clay fill should be stabilized with lime as soon as it is placed.

(6) Clay Borrow Pit

(a) Observation: Heavy rains during this period has decreased greatly the ability to operate a clay borrow pit.

(b) Evaluation and Recommendation: The following method has been used to run a clay borrow pit under wet conditions. Fill is pushed up by dozers into large piles which remain above water level and drain easily. The stockpiled material is moved by dozer to existing roads as close as possible. This allows early utilization of the stockpile during breves in the monsoon season without extensive rehabilitation of the access road. The haul vehicles are able to be loaded on the existing road. The fill is loaded from the stockpiles into five-ton dumps with a scoop loader. Each morning the five ton dump trucks haul one load of sand to the job site. The sand is used to maintain a dry stable working area for the scoop loader.

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EGTE-OP

SUBJECT: Operational Report -Lessons Learned (MCS-OSFOR R1) for Quarterly
Period Ending 31 July 1969

(7) Computing Volumes Hauled by Five-Ton Dump Trucks

(a) Observation: A easy method was required to compute volumes of earthwork for 5-ton dump trucks working a ten-hour shift under conditions which change from day to day.

(b) Evaluation: Using the graphs contained in inclosure 1 the following procedure to determine volumes apply.

- 1 Find total round trip distance (d) of the haul.
- 2 Sum up the amount of time (tf) that one truck spends waiting in line, loading, accelerating, dumping, etc. for one cycle.
- 3 Convert this time (tf) to an equivalent distance (df) using graph 1. Enter the graph at the appropriate value of (tf); read upward to the line which corresponds to traffic conditions on the haul road; read to the right to find equivalent distance. The velocity traveled should be mean velocity.
- 4 Sum the actual haul distance (d) with the equivalent distance (df) to find the total equivalent haul distance (d).
- 5 To find total cubic yards per day using graph 2. Enter the total equivalent haul distance at the appropriate value and read upward to the line which corresponds to traffic conditions on the road. Then read left to the line which corresponds to the total number of trucks on the haul. Finally read down to find the total number of cubic yards per day.

(c) Recommendation: Adaption of the above method to determine the amount of 5-ton dump trucks needed for earthmoving.

(8) Compacting Bridge Approaches

(a) Observation: Difficulty has been encountered in compacting the sand fill material close to bridge abutments.

(b) Evaluation: Selective routing of 290M tractors has been used successfully for the compaction of sand-fill approaches. The 290M's were able to compact 10-inch lifts to 103% maximum modified AASHTO dry density within 1 foot of the concrete abutments. Other compaction equipment could not give equivalent results close to the abutments due to the limited room for maneuver.

(c) Recommendation: In sand fills where maneuver ability is limited and high compactive effort is required, the use of 290M's will give desired compaction.

ECOT 02

SUBJECT: Technical Report 100-1-1 (ECOT-CEFOR R1) for Quarterly
Period Ending 31 July 1969

(9) 290M Tractor and Scraper

(a) Observation: The heavily traveled roads of Vietnam are few and narrow and suitable terrain to construct detours is scarce.

(b) Evaluation: When repairs or new construction of narrow roads are underway, traffic tie-ups and hazards to construction crews are created due to the time and area needed to operate the conventional jersey spreader and 5-ton dump trucks. However, by using a 290M tractor with 18 cubic yard scraper, it was found that a sufficiently even lift of base course could be spread while moving with the traffic. In addition one lane of traffic could be maintained due to 10' width of the 290M. This reduces the tie-up of traffic, the number of pieces of construction equipment needed on the project site, and construction personnel.

(c) Recommendation: When spreading base course aggregate in highly congested areas consider use a 290M tractor with 18 cubic yard scraper.

(10) Modification on Concrete Vibrator

(a) Observation: When operations require construction of concrete slabs or panels with a intricate reinforcing bar pattern, it is difficult to place the concrete and insure proper densities and bonding of the concrete to the reinforcing bar. Working the concrete through the reinforcing bar is extremely tedious and often results in honey combed panel bottoms.

(b) Evaluation: The standard concrete vibrator is too large to conveniently work around intricate reinforcing bar pattern. The welding of 4 each 12" pieces of #4 reinforcing bar to the vibrator (See Inclosure 2) provides 4 prongs that will easily work in the confined areas between the bar patterns, insuring adequate densities and eliminating the honey-comb.

(c) Recommendation: Use this method when working with tight reinforcing bar patterns.

(11) Antenna RC-292

(a) Observation: Adverse effects of high humidity while utilizing the RC-292 Antenna.

(b) Evaluation: Due to the high humidity factor in the Mekong Delta the RC-292 should require additional maintenance which is not listed in Organizational Maintenance Instructions, (chapter 4) of TM 11-5820-348-15.

(c) Recommendation: That additional maintenance be added to existing Technical Manual for operation of this equipment in a climate such as found in the Mekong Delta. Additional maintenance required for areas of high humidity factor should include taping of joints between antenna mast sections to prevent moisture and rain from seeping into the joints and causing the sections to freeze together.

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SUBJECT: Operational Report - Lessons Learned (OSL) (Form 1) for Quarterly
Period Ending 31 July 1960

d. Training: None

e. Logistics: None

f. Maintenance:

(1) Civilianization of Maintenance Personnel in the Construction Battalion.

a. Observation: During the civilianization of this unit under Program VI, the unit was reduced by approximately 50% of its authorized US Engineer mechanics (grades E-3 and E-4). The unit was authorized to hire an equal number of local nationals against the US space reduction.

b. Evaluation: Experience has shown that it is difficult to hire a LN to fill in as an engineer mechanic. Though over a period of time a LN can be trained but he still does not prove to be capable of the job. The LN does not prove to be physically able to perform the heavy physical labor involved in repair of heavy engineer equipment nor can they be efficiently used as US personnel. LN prove to be capable ordinance vehicle mechanics. A problem is encountered in use of the TM, most essential in maintenance, by the LN. Displacement of an engineer unit requires mobility of personnel. The local national is not at all interested in displacing with a unit and is not at all interested in working in an area that is not secure.

c. Recommendation: In civilianizing engineer units serious consideration should be given to how the maintenance capability of the unit will be effected.

(2) Significant Increase of Earthmoving Equipment

(a) Observation: Whenever a unit is significantly reinforced with heavy equipment, it must be adequately supported with an additional maintenance capability.

(b) Evaluation: This unit was reinforced with twice the number of D7E's (17 each) and half again as many 290M tractor-scraper (11 each) to support the QL-4 project. However, there was no additional maintenance support provided to the battalion. In fact civilianization had reduced its maintenance capability (see para above). As a result, it was physically impossible for the unit DSU and organization maintenance team to keep up with repair problems. After several months operation a significant backlog of repair work had resulted. It has taken this unit a considerable time to catch up on this maintenance backlog.

(c) Recommendation: When supporting a unit with additional equipment a suitable maintenance team must accompany the additional equipment. Another solution would be to designate or arrange for a general support unit to assume the maintenance overflow from the direct support unit.

(3) Emergency Replacement for a 10-ton Tractor Air Filter

(a) Observations: Due to the severe dust conditions air filters must be changed frequently causing supplies to become exhausted.

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SUBJECT: Operational Report-Lessons Learned (RCS CSFOR R1) for Quarterly
Period Ending 31 July 1969

(b) Evaluations: An emergency replacement for a 10-ton tractor air filter (FSN 2940-858-8178) can be fabricated from a Caterpillar D8 air filter (FSN 2940-902-5553). Cut off the center section of the D8 filter so that it will fit the 10-ton filter housing. Make a gasket and sheet metal plate to seal the D8 filter.

(c) Recommendations: In emergency conditions the modified D8 air filter will replace the 10-ton tractor air filter.

(d) Supply: None

(e) Medical

(1) Miliria Rubra

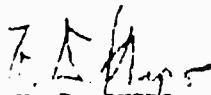
(a) Observation: Miliria Rubra does not respond to recommended RX.

(b) Evaluations: The treatment of heat rash by the recommended use of ascorbic acid and tetracycline does not appear to have any appreciable effect on the course of the disease. The use of topical hydrocortisone resulted in noticeable improvement.

(c) Recommendation: That topical hydrocortisone be used in the treatment of Miliria Rubra in conjunction with frequent showers and cooling period.

2 Incl

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V. D. STIFO
LTC, CE
Commanding

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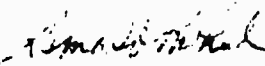
EGF-OP (10 Jul 69) 1st Ind
SUBJECT: Operational Report of 36th Engineer Battalion Period Ending
31 July 1969, ACS-CSFOR - 65 (R1)

DA, HEADQUARTERS 34TH ENGINEER GROUP (CONST), APO 96320 13 August 1969

TO: Assistant Chief of Staff for Force Development, Department of the Army,
Washington, D.C. 20310
Commanding General, 20th Engineer Brigade, ATTN: AVBI-OS, APO 96491

1. The subject report submitted by the 36th Engr Bn has been reviewed by this HQ and is considered comprehensive and of value for documentation and review of the reporting unit's activities and experiences.
2. This HQ concurs with the submitted report with the following comments:
 - a. Ref para IIb(1), page 3: Concur this practice should be followed whenever possible.
 - b. Ref para IIb(2), page 3: The practice of building dikes to prevent paddies from flooding during high tide is another important consideration along these same lines.
 - c. Ref para IIb(3), page 4: The use of scrapers during the rainy season also creates a tremendous problem of maintaining haul roads.
 - d. Ref para IIb(5), page 4: This solution may help somewhat but will certainly not eliminate the problem of keeping the haul road trafficable.
 - e. Ref para IIb(8), page 5: The problem of obtaining uniform compaction throughout the road cross section might be encountered.
 - f. Ref para IIb(9), page 6: While this method may have some merit for those reasons mentioned, the use of the 290M would also create the problem of ununiform lift depths and uneven transitions between loads.

FOR THE COMMANDER:


DONALD L. WHEELER
Major, AGC
Adjutant

CF:
CO, 36th Engr Bn

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AVBI-OS (10 Aug 69) 2nd Ind
SUBJECT: Operational Report of the 36th Engineer Battalion
(Construction) for the Period Ending 31 July 1969,
RCS-CSFOR-65 (R1)

DA, HEADQUARTERS, 20TH ENGINEER BRIGADE, APO 96491

TO: Commanding General, United States Army Vietnam,
ATTN: AVHGC-DST, APO 96375

1. Submitted in accordance with USAHV Regulation 525-15, dated 13 April 1968.
2. Subject report for the 36th Engineer Battalion (Construction) has been reviewed and is considered adequate.

FOR THE COMMANDER:

[Signature]
B. KENNEDY
Major, AGC
Adjutant

Copies Furnished:
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CO, 36th Engr Bn

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AVHGC-DST (10 July 1969) 3d Ind

SUBJECT: Operational Report-Lessons Learned (RCS-CSFOh-65) (R1) for Quarterly
Period Ending 31 July 1969 **24 SEP 1969**

HEADQUARTERS, UNITED STATES ARMY, VIETNAM, APO San Francisco 96375

TO: Commander in Chief, United States Army, Pacific, ATTN: GPOF-DT,
APO 96558

1. (U) This headquarters has reviewed the Operational Report-Lessons Learned for the quarterly period ending 31 July 1969 from Headquarters, 36th Engineer Battalion (Const).

2. (C) Comments follow:

a. (U) Reference item concerning "Computing Volumes Hauled by Five-Ton Dump Trucks," section II, page 5, paragraph 3b(7); concur. This method is an application of linear programming and may be acceptable for a particular set of circumstances. For application in the general case, parameters considering efficiency of hauling units, experience data on breakdowns and other delays, meal and maintenance halts, and variation in total shift time should be included.

b. (U) Reference item concerning "Antenna RC-492," section II, page 6, paragraph 3b(11); concur. Black electrical tape, FSN 5970-644-2636, is recommended for this purpose.

c. (C) Reference item concerning "Civilianization of Maintenance Personnel in the Construction Battalion," section II, page 7, paragraph 3f(1); concur. During the planning for USAKV implementation of Program 6 Civilianization in June 1968, it was decided that Engineer Construction Battalions would be reduced from a Type A level to Type B. This resulted in, among other things, the 50 percent reduction in low grade military engineer mechanics for those units. Subsequent operations reports submitted by the USAKV Engineer have repeatedly pointed out the degradation in LOC mission accomplishment caused by this action. In February 1969, MACV agreed to raise the engineer construction battalions back to Type A level by using spaces accrued from inactivations under the RVNAF Improvement and Modernization program. This action is still in progress. In any future civilianization programs, more planning emphasis will be placed on the possible effects of military space withdrawal on a unit's maintenance capability.

d. (U) Reference item concerning "Significant Increase of Earthmoving Equipment," section II, page 7, paragraph 3f(2); concur. As additional equipment is obtained provisions must be made to provide for the maintenance support of the equipment. This can usually be provided from the units losing the equipment, by the creation of a special maintenance team from group assets, or by coordination with 1st Logistical Commands DSU's.

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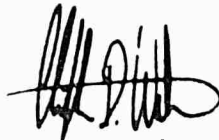
AVHGC-DST (10 July 1969) 3d Ind

SUBJECT: Operational Report-Lessons Learned (RCS-CSFOR-05) for Quarterly
Period ending 31 July 1969

e. (U) Reference item concerning "Emergency Replacement for a 10-ton Tractor Air Filter," section 11, page 7, paragraph 3f(3); concur. The modification of D8 air filters as described is a satisfactory solution when 10-ton truck air filters are in short supply. The unit should, however, make every effort to obtain the correct filter. Information received from the USA10CV indicates that the current supply position of 10-ton truck air filters is satisfactory.

f. (U) Reference item concerning "Miliaria rubra does not respond to recommended RX," section 11, page 8, paragraph 3e(1); concur. This subject was discussed at the semi-annual USARV Surgeon's Conference, 22 August 1969. The treatment of Miliaria Rubra has not been established. Both treatments discussed seem to work in some cases. Only complete air conditioning of the patient is totally effective but impractical. Continued professional interest in all approaches to therapy are encouraged.

FOR THE COMMANDER:



C. D. WILSON
1LT, AGC
Assistant Adjutant General

Cy furn:
36th Engr Bn
20th Engr Bde

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GPOP-DT (10 Jul 69) 4th Ind (U)

SUBJECT: Operational Report of HQ, 36th Engr Bn (Const) for Period
Ending 31 July 1969, RCS CSFOR-65 (R1) (U)

HQ, US Army, Pacific, APO San Francisco 96558 16 OCT 69

TO: Assistant Chief of Staff for Force Development, Department of the
Army, Washington, D. C. 20310

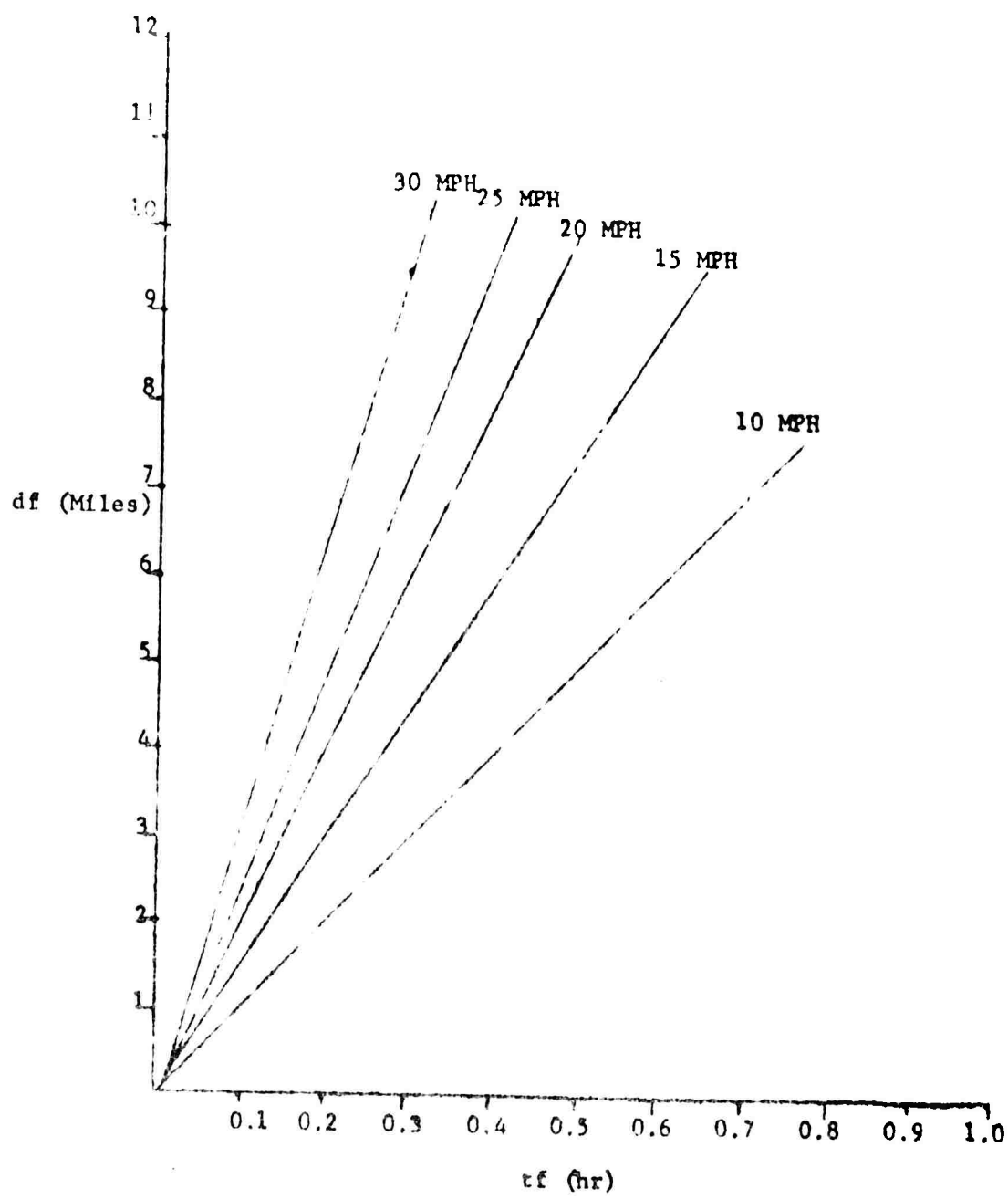
This headquarters concurs in subject report as indorsed.

FOR THE COMMANDER IN CHIEF:


C. J. SHORTT
CPT, AGC
Asst AG

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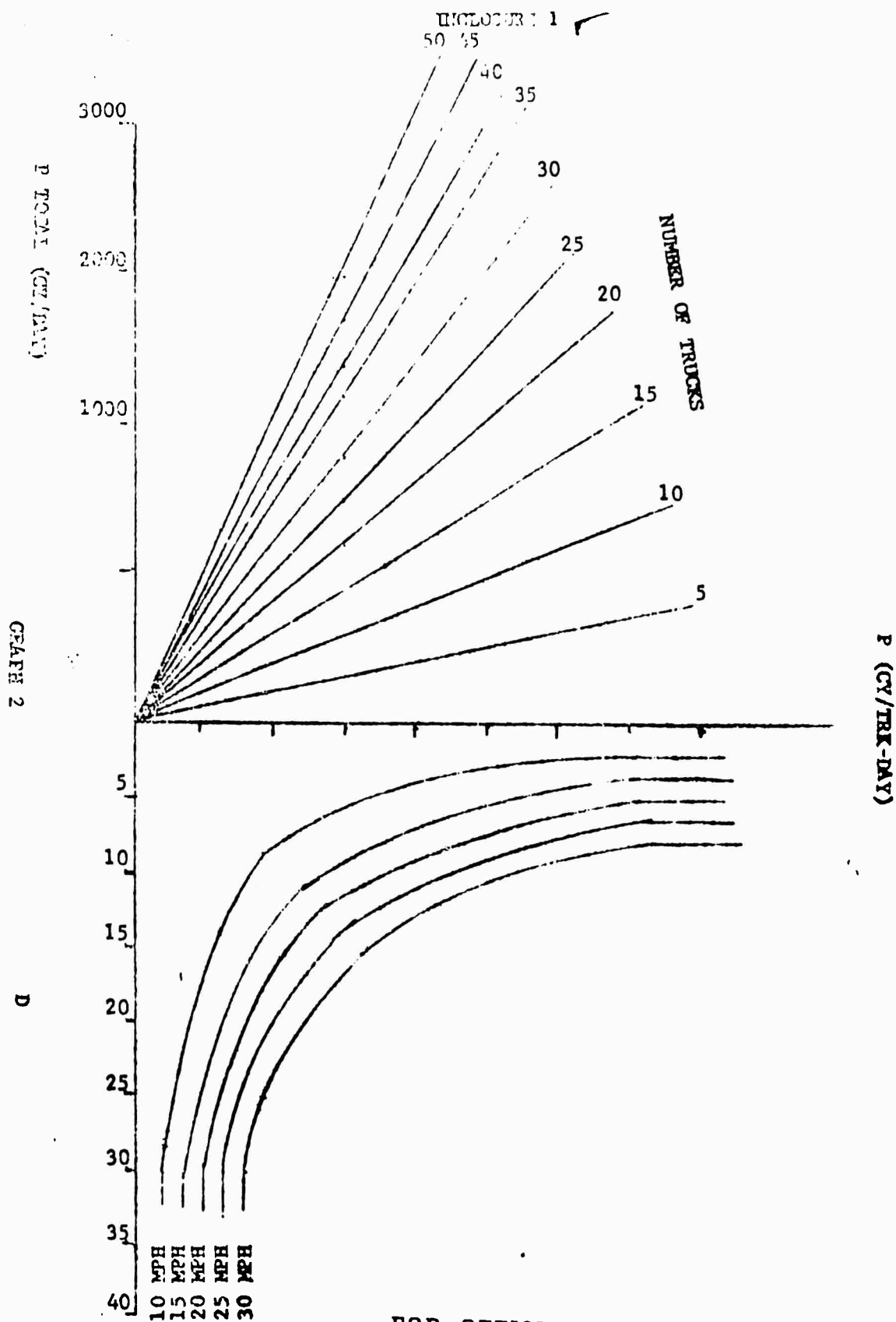
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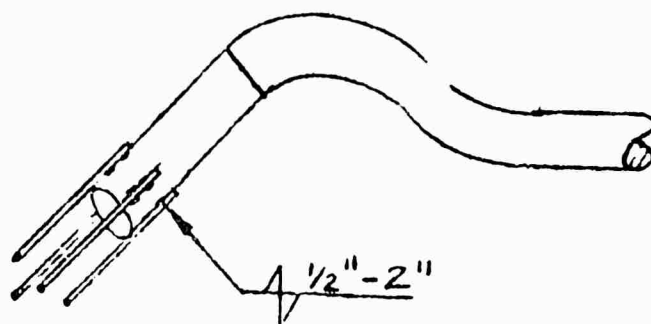
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Modification of Concrete Vibrator

16

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